

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch

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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 1.28**WELDING INSPECTION REPORT****Resident Engineer:**Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-024264**Date Inspected:** 02-Jun-2011**Project Name:** SAS Superstructure**OSM Arrival Time:** 700**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1530**Contractor:** American Bridge/Fluor Enterprises, a JV**Location:** Job Site**CWI Name:** Pat Swain**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** Tower**Summary of Items Observed:**

This Quality Assurance (QA) Inspector, Craig Hager was on site at the job site between the times noted above.

This QA Inspector was on site to randomly observe Quality Control (QC) personnel perform Non-Destructive Testing (NDT) and monitor American Bridge/Fluor (ABF) welding operations. This Quality Assurance (QA) Inspector, Craig Hager observed the following.

This QA Inspector observed ABF personnel working at the 9 meter level in an effort to weld the external diaphragm plates to the various shear plates and tower skin plates. This QA Inspector observed the following during the shift noted above.

This QA Inspector observed ABF welding personnel were in the process of setting up the induction preheating equipment at weld joints #45 and #46 at approximately 0730 hours. At approximately 0900 hours QC Inspector Pat Swain informed this QA Inspector the minimum preheat temperature of 225°F had been obtained. This QA Inspector verified the preheat temperature using an electronic temperature gauge.

This QA Inspector observed ABF welding personnel Wai Kitlai (#2953) was setting up the Flux Cored Arc Welding (FCAW) equipment to begin welding on weld joint #45.

This QA Inspector observed ABF welding personnel Hua Qiang Hwang (#2930) was setting up FCAW equipment to begin welding on weld joint #46.

At approximately 0945 hours FCAW began at weld joint #45 and #46. This QA Inspector observed as QC

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## WELDING INSPECTION REPORT

( Continued Page 2 of 3 )

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Inspector Pat Swain verified the following welding parameters; Hua Qiang Hwang (#2930) - 265 amperes and 25.5 volts at a travel speed of 369 mm per minute to produce a heat input of 1.10 Kj per mm and Wai Kitlai (#2953) - 269 amperes and 25.1 volts at a travel speed of 548 mm per minute to produce a heat input of 0.74 Kj per mm. These parameters appeared to comply with Welding Procedure Specification (WPS) ABF-WPS-D15-3160-1.

This QA Inspector observed as QC Inspector Pat Swain perform a visual and Magnetic Particle Testing (MT) on the root pass of each weld. The root pass of weld #45 was approximately 1070 mm long from the East end of the to the previously welded section in the middle. The root pass of weld #46 was approximately 1100 mm long from the East end to the previously welded section in the middle. This QA Inspector was informed by QC Inspector Pat Swain that the root passes of both welds passed both the visual and MT inspection. This QA Inspector performed a random visual verification and observed the work appeared to comply with the contract requirements.

This QA Inspector periodically observed QC Inspector Pat Swain monitoring the work at this location.

This QA Inspector observed welding continued at weld joints #45 and #46 until approximately 1200 hours. This QA Inspector observed the welding appeared to have been completed and the induction heating blankets were placed over the welds to start the 3 hour post heating.

This QA Inspector observed various ABF personnel continued to tear down the Electro Slag Welding (ESW) equipment at weld joint S-045 and move it to weld joint #S-046.

This QA Inspector observed as ABF welding personnel Jeremy Dolman (#5042) tack welded the sump blocks into position from the center section of the tower. This QA Inspector randomly observed a hand held torch was used for preheating to an approximately temperature of 200°F, verified by QC Inspector Steve McConnell. This QA Inspector observed the Shielded Metal Arc Welding (SMAW) process was used for tack welding and verified the following parameters, 125 amperes using a 3.2 mm diameter E7018H4R electrode. The welding observed appeared to comply with Welding Procedure Specification (WPS) ABF-WPS-D15-F1200A Rev-2, see photo below..

This QA Inspector was informed that ABF welding personnel were ready for QC personnel to start measuring the root gap and offset at approximately 0745 hours. QC Inspectors Steve McConnell and QC Inspector Jesse Cayabyab started the fit up measurements for the 60 mm to 70 mm transition but joint identified as S-044. This QA Inspector observed the root gap and offset measurements were taken from the center cell opposite the 60-70 mm transition in the northern cell. This QA Inspector observed measurements were taken from the 3-meter elevation, the start of the weld joint to the end of the weld joint at the 13 meter elevation. The measurements for both were recorded on a specific QC form and appeared to almost identical to the measurements taken by this QA Inspector. See photo of offset from approximately 2000 mm mark above the sump towards the sump. The largest offset, 8 mm appeared at this location. All measurements and the layout of the weld joint had been completed by approximately 0930 hours.

This QA Inspector observed the Consumable Guide (CG) had been inserted and that the ceramic insulators had started to be installed at approximately 1100 hours this date.

This QA Inspector observed ABF welding personnel grinding the marked areas on ESW #S-045. Please reference

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## WELDING INSPECTION REPORT

( Continued Page 3 of 3 )

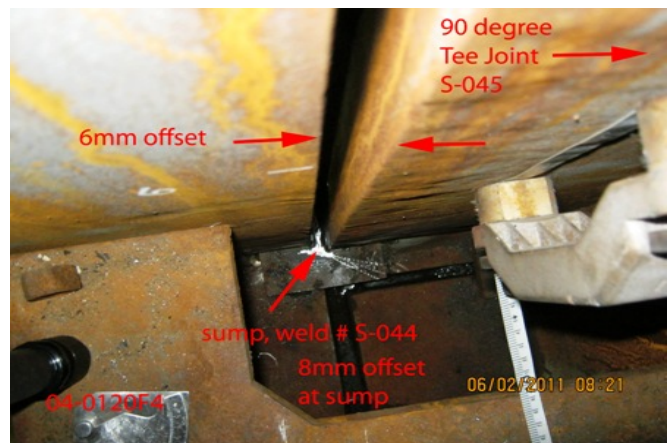
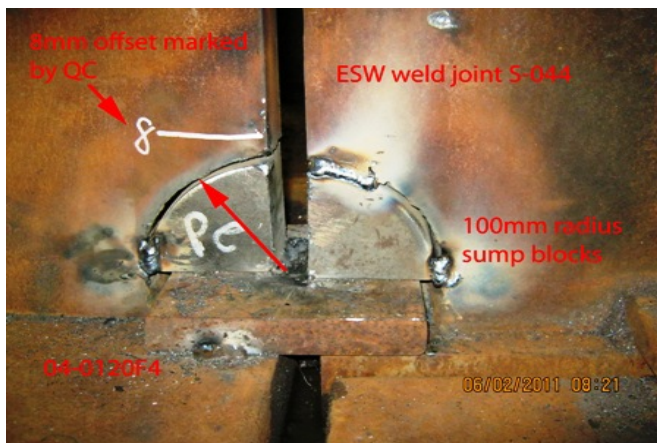
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reports from QA Inspector Jojo Lizardo regarding further QA verifications on ESW this date.

This QA Inspector was informed by QC Inspector Steve Jensen he had performed and accepted the visual inspection of the Splice Plate weld identified as 161-ES located in the East tower section. This QA Inspector performed a random visual verification and the work appeared to comply with the contract requirements.

### Summary of Conversations:

This QA Inspector had general conversations with American Bridge/Fluor (ABF) and Caltrans personnel during this shift. Except as described above and noted below there were no notable conversations.



### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy (510) 385-5910, who represents the Office of Structural Materials for your project.

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**Inspected By:** Hager,Craig

Quality Assurance Inspector

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**Reviewed By:** Levell,Bill

QA Reviewer

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